



*Original of # 86*

Attorney Docket No. 03203-0006-03000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:  
JEAN-YVES CHENARD et al.

Application Serial No.: 07/870,759

Filed: April 20, 1992

For: IMPROVEMENT IN THE  
STABILIZATION OF VINYL  
HALIDE POLYMERS

Group Art Unit: 1511

Examiner: V. Hoke

BOARD OF PATENT APPEALS  
AND INTERFERENCES  
APR 27 PM 3:48

Honorable Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

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**REQUEST FOR REHEARING PURSUANT TO 37 CFR § 1.197(b)**

Appellants request rehearing of the Board's decision dated February 23, 1999  
under the provisions of 37 C.F.R. §1.197(b).

**I. BACKGROUND**

**A. The Board's Decision**

On February 23, 1999, the Board reversed-in-part and affirmed-in-part the examiner's final rejection of all claims in the application. In particular, the Board affirmed the examiner's rejection of all claims as obvious under 35 U.S.C. § 103(a) over the combination of Gough, Stapfer, Hechenbleiker '129 and '527, Wowk, Schroeder, Weinberg '750 and Kauder '915. Appellants' request for rehearing relates to the issues of whether a prima facie case of obviousness under 35 U.S.C. § 103(a) exists in view of the cited combination of references, particularly Gough and Stapfer, and whether the Rule 132 declaration evidence submitted by Appellants during prosecution overcomes the rejection.

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## **B. The Claimed Invention**

### **1. The sulfur-containing claims**

Claims 193-198, 200-207, 209-217, 219-225, 227-233, and 237-295 are directed to compositions and methods for stabilizing vinyl halide resins. These claims are simply referred to as the sulfur organotin claims. Representative claim 247 recites:

A composition comprising a product produced by mixing

(1) a mono- or diorganotin compound wherein at least one atom bonded to tin is sulfur; and (2) a mercapto alkanol ester of a monocarboxylic acid.

### **2. The halogen-containing claims**

Claims 176-183 and 296-323 are also directed to compositions and methods for stabilizing vinyl halide resins. These claims are referred to herein as the halogen organotin claims. Representative claim 296 recites:

A composition comprising a product produced by mixing

(1) a mono- or diorganotin compound wherein at least one atom bonded to tin is a halogen; and (2) a mercapto alkanol ester of a monocarboxylic acid.

## **II. GROUNDS FOR REHEARING**

### **A. The Board Mischaracterizes The Gough And Stapfer References**

As an initial matter, Appellants note that the Board mischaracterizes the two references relied on by name in the Board's affirmance, namely Gough, the primary reference, and Stapfer. The Board mischaracterizes Gough as disclosing that "it was known in the art to employ synergistic combinations of organic thiols and organotin mercaptides as stabilizers for vinyl halide polymers."<sup>1</sup> Gough, however, does not disclose a combination stabilizer of organic thiols and organotin mercaptides. Rather, as explained below, Gough discloses single use stabilizers of an organic thiol or (not and) an organotin mercaptide.

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Board Decision at 13-14.

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In the context of describing his invention (an organotin borate with an organic thiol), Gough characterizes the known prior art.<sup>2</sup> In particular, Gough states that:

[t]o inhibit or prevent discoloration of vinyl halide homopolymers, copolymers and mixtures of polymers containing vinyl halide homopolymers or copolymers it has been known in the art to incorporate therein such materials as organic thiols, hindered phenols, tin carboxylates, organotin carboxylates, and organotin mercaptides. Synergistic combinations such as a combination of an organic thioanhydride and a monohydrocarbonyl tin compound . . . have also been reported for improving the resistance of halogen containing resin to early color development during processing. Many of these materials which have been used or suggested to be used to improve the resistance of halogen containing resins to early color development during processing have not been entirely satisfactory, or are expensive or are difficult to make, or have undesirable properties such as being odoriferous during processing of the plastic or in themselves impart some initial color to the plastic.<sup>3</sup>

Gough discloses only two stabilizer combinations, namely: (1) an organotin borate and an organic thiol (i.e., the disclosed and claimed invention of Gough); and (2) an organic thioanhydride and a monohydrocarbonyl tin compound (i.e., the known art). Neither of these is the claimed combination. Nor is there a disclosure of the combination of an organic thiol and an organotin mercaptide, as stated in the Board's Decision.

The Board also mischaracterizes Stapfer as "a further teaching that it was known in the art that a combination of organotin mercaptides and organic thiols

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<sup>2</sup> Gough's invention relates to a novel synergistic stabilizer composition to inhibit or prevent discoloration of vinyl halide homopolymers, copolymers and mixtures of polymers, comprising an organotin borate and an organic thiol compound. (See col. 1, lines 8-7.) Examples of organic thiol compounds disclosed by Gough include mercapto alkanol esters of a monocarboxylic acid. (See, e.g., col. 3, line 60, formula "f" and col. 8, line 64, "2-thioethyl octanoate.")

<sup>3</sup> Col. 1, lines 44-66.

provides synergistic stabilization of vinyl halide resins."<sup>4</sup> Stapfer, however, does not disclose such a combination.

Like Gough, Stapfer generally relates to stabilizing compositions for halogenated resins. More specifically, Stapfer discloses new combinations of sulfur-containing organic compounds with organotin compounds.<sup>5</sup> Stapfer also characterizes the known prior art when distinguishing his invention. In particular, Stapfer states:

[d]uring recent years a number of organic compounds containing divalent sulfur have been contemplated as stabilizers against the thermal decomposition of halogen containing resins, and in particular polyvinyl chloride. Most of these organic compounds such as sulfides, disulfides, polysulfides, thioacetals, thio anhydrides and  $\beta$ -aminocrotonic acid esters of sulfur bearing diols, exhibit fair long term stabilizing efficacy for both plasticized and rigid formulations but they have never gained commercial importance because substantial discoloration of the polymer occurs during processing. Among the numerous types of compounds proposed for the stabilization of halogen-containing resins, organotin mercaptides and mercapto esters have been found to be particularly efficient and have been commercially used to a steadily increasing extent.<sup>6</sup>

Stapfer discloses as part of the background art only single use stabilizers, i.e., not in combination. Although Stapfer allegedly overcomes the disadvantages of the known art by "including small amounts of a monohydrocarbyl tin compound with the organic thio compounds,"<sup>7</sup> none of these compounds is Appellants' claimed mercapto alkanol ester of a monocarboxylic acid. The

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<sup>4</sup> Board Decision at 14.

<sup>5</sup> See col. 1, lines 12-18.

<sup>6</sup> Col. 1, lines 36-51.

<sup>7</sup> Id., lines 52-54.

organic "thio" compounds disclosed by Stapfer include (a) thioethers, (b) disulfides, (c) tetrasulfides, (d) thioanhydrides, and (e) dithioethers.<sup>8</sup> Stapfer also discloses several thiol compounds as examples of suitable organic thio compounds, for example, poly (diethylene glycol) ethylidene-bis-mercaptoethanol.<sup>9</sup> Stapfer does not disclose Appellants' claimed mercapto alkanol ester of a monocarboxylic acid.

In summary, Gough discloses two combinations, namely organotin borates with organic thiol compounds and monohydrocarbyl tins with organic thioanhydrides. Stapfer discloses the combination of monohydrocarbyl tins with organic thio compounds. These disclosures, whether considered separately or together, do not render Appellants' claimed invention obvious to one of ordinary skill in the art.

**B. The Board's Combination Of Gough And Stapfer Is Improper**

The starting point for an analysis of a rejection under 35 U.S.C. § 103(a) involving a combination of references is the consideration of at least two factors: (1) whether the prior art would have suggested to the skilled artisan the claimed composition; and (2) whether the prior art provided those making the claimed invention a reasonable expectation of success. In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). See also, In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). "Both the suggestion and

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<sup>8</sup> Col. 3, lines 13-35.

<sup>9</sup> Id., lines 44-45.

the expectation of success must be founded in the prior art, not in the applicant's disclosure." Dow Chemical 837 F.2d at 473, 5 USPQ2d at 1531.

Moreover, references may not be combined to establish a prima facie case of obviousness without a suggestion to do so, found either in the references themselves or in the knowledge generally available. In re Jones, 958 F.2d 347, 351, 21 USPQ2d 1941, 1943-44 (Fed. Cir. 1992). In other words, it is not enough that a reference can be modified. The invention would not have been "obvious unless the prior art suggested the desirability of the modification." In re Laskowski, 871 F.2d 115, 117, 10 USPQ2d 1397, 1398 (Fed. Cir. 1989) (citing In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)). As demonstrated below, the prior art does not suggest Appellants' claimed stabilizer composition, does not provide a reasonable expectation of success, and does not provide the requisite suggestion or motivation to combine the references in the manner suggested by the examiner.

For starters, the Board mischaracterizes the scope of the disclosures in Gough and the other prior art references when it concludes that:

one of ordinary skill in the art would have understood that the synergistic combination of Gough is superior to other known combinations of stabilizers, and that other combinations of Appellants' organotin compounds and a mercapto alkanol ester of a monocarboxylic acid *are effective, if not equivalent, stabilizers for vinyl halide resins*. . . . (emphasis added). Inasmuch as absolute predictability is not a requirement for a finding of obviousness under 35 U.S.C. § 103, we find that one of ordinary skill in the art would have had a reasonable expectation of successfully stabilizing a vinyl halide resin with a combination of Appellants' mercapto

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alkanol ester of a monocarboxylic acid, disclosed by Gough, and a conventional organotin stabilizer.<sup>10</sup>

The flaw in the Board's argument is that the prior art does not even remotely suggest combining a mercapto alkanol ester of a carboxylic acid with a sulfur or halogen containing organotin compound. In reality, the Board's conclusion above is tantamount to an obvious to try standard. The Federal Circuit has, however, on more than one occasion, stated that "obvious to try" is not the correct standard. See Dow Chemical, 837 F.2d at 473, 5 USPQ2d at 1531 (rejecting the PTO's "obvious to experiment" standard).

The Board erroneously concludes that the Gough and Stapfer references could be combined or, alternatively, that the combination suggests the claimed invention.<sup>11</sup> Stapfer apparently is relied upon by the examiner and the Board to overcome the shortcomings of Gough.<sup>12</sup> Stapfer and the other secondary references, however, fail to provide the requisite suggestion or motivation to arrive at Appellants' claimed invention.

Collectively, as described above, the Gough and Stapfer references disclose three stabilizer combinations for halogenated resins such as PVC. Gough discloses two of the stabilizer combinations, namely (1) organotin borates

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<sup>10</sup> Board Decision at 14-15.

<sup>11</sup> The other references used in the §103(a) rejection do not overcome any of the deficiencies of the Gough and Stapfer references. Accordingly, Appellants do not specifically discuss these other references herein, but reserve the right to discuss them should an appeal or other action become necessary.

<sup>12</sup> Board Decision at 14.

with organic thiol compounds and (2) monohydrocarbyl tins with organic thioanhydrides. Stapfer discloses the third (3) stabilizer combination of monohydrocarbyl tins with organic thio compounds.

Neither the Board nor the examiner articulates where the suggestion comes from to modify Gough by replacing the organotin borate with a halogen or sulfur organotin compound to arrive at the claimed invention. Apparently, the Board relies on the disclosure in Stapfer of a stabilizer combination of a monohydrocarbyl tin and an organic thio compound,<sup>13</sup> which "thio" compound broadly encompasses the subgenus of "thiols." The Board then concludes, apparently based on the teaching in Gough of a stabilizer combination of organotin borates and organic "thiols" (including a mercapto alkanol ester of a monocarboxylic acid), that it would have been obvious to replace the organotin borate with another organotin compound such as a sulfur or halogen organotin compound because they are well known in the art.

This argument is seriously flawed because the only possible stabilizer combination suggested by Gough and Stapfer, contrary to the Board's position, is not Appellants' claimed invention. In other words, while Gough and Stapfer may, arguably, be combined to suggest a stabilizer combination, that combination does not teach or suggest the Appellants' claimed invention. In fact, as explained below, Gough teaches one of skill in the art away from the only possible combination suggested by the Gough and Stapfer disclosures.

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<sup>13</sup> Col. 1, lines 52-54.



Even if one skilled in the art had been motivated to combine the teachings of Gough and Stapfer, which Appellants do not admit is the case, because they both relate to mixtures or combinations of stabilizer compositions, one skilled in the art would not arrive at the claimed combination. At best, what is fairly suggested by the combination is a stabilizer composition comprising a monohydrocarbyl tin and an organic thio compound. More specifically, Gough discloses as background art the known stabilizer combination of a monohydrocarbyl tin and an organic "thioanhydride" compound. The Stapfer reference cited by the examiner discloses a slightly broader class of organic "thio" compounds. Thus, if one skilled in the art would have combined these references, one would have replaced the organic "thioanhydride" of Gough with the slightly broader organic "thio" of Stapfer because both employ a monohydrocarbyl tin stabilizer and "thioanhydride."

This is precisely the prior art stabilizer combination, however, that Gough teaches away from in describing his stabilizer combination of an organotin borate and an organic thiol compound, which he alleges produces superior results.<sup>14</sup> Thus, there is no motivation whatsoever to replace the organotin borate of Gough with the broader class of organotins disclosed in Stapfer or elsewhere because one skilled in the art would not have had a reasonable expectation of success based on Gough's disclosure. Despite paying lip service in its decision to the "reasonable expectation of success standard" required by Federal Circuit precedent, the Board

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See generally, col. 1, line 20 to col. 2, line 11.

nonetheless attempts to use an "obvious to try" standard, and at the same time ignores that Gough teaches away from the only combination which Gough and Stapfer suggest if combined.

Gough clearly distinguishes between a stabilizer combination containing an organotin borate and other organotin compounds, including sulfur containing organotin compounds. Thus, Gough teaches that organotin borates are superior to sulfur or halogen containing organotins (i.e., not equivalent), and therefore may not be substituted. Why would one of ordinary skill in the art be motivated to substitute a halogen or sulfur organotin compound for the organotin borate of Gough when Gough clearly distinguishes over other stabilizer compositions using something other than organotin borates? The simple answer is they would not.

Appellants also submitted Rule 132 evidence during prosecution which demonstrates that organotin borates are not equivalent to other well known organotin compounds, including the claimed sulfur and halogen organotin compounds.<sup>15</sup> More specifically, the Foure declaration submitted during prosecution provides compelling proof that organotin borates when used alone do not work. In particular, "Experiment 6" shows that an organotin borate alone had little or no stabilizing effect.<sup>16</sup> Why would one skilled in the art be motivated to substitute a well-known organotin compound that works, including those claimed by Appellants, with one that does not work? There simply is no motivation to

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<sup>15</sup> See Exhibit 6 of Appellants' "Brief on Appeal" (hereafter "Ex. 6").

<sup>16</sup> Ex. 6, Experiment 6, at 11.

make the substitution suggested by the Examiner and the Board. Indeed, one has to assume that it is the unique combination suggested by Gough that works. Why would Appellants' organotin compounds be expected to work in Gough's unique combination? Again, there is nothing to suggest that they would.

Neither Gough nor Stapfer, or any other secondary reference cited by the examiner, provides the suggestion or motivation to replace the organotin borate of Gough with another organotin compound, and certainly not the claimed sulfur or halogen organotin compound. The fact that Gough and Stapfer may teach, collectively, the individual components of Appellants' claimed invention does not warrant the conclusion that the claimed invention is suggested to one of ordinary skill in the art. Moreover, the ability to modify the prior art is not enough to suggest the modification. See In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.").

Finally, the present facts are similar to the facts in the Federal Circuit's In re Baird, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992) decisions. In both cases, the Federal Circuit reversed the Board's § 103 rejection over the prior art because the prior art failed to suggest from an infinite number of possibilities the claimed invention. See Baird, 16 F.3d at 383, 29 USPQ2d at 1552; Jones, 958 F.2d at 350, 21 USPQ2d at 1943. Similarly in the present case, even if combined, Gough and

Stapfer teach an infinite number of possibilities for organotin compounds and thio compounds. The prior art fails to suggest Appellants' unique combination of a sulfur or halogen organotin compound and mercapto alkanol ester of a monocarboxylic acid.

**C. Appellants' Rule 132 Evidence Rebutts Any Prima Facie Case**

The Board neglected to carefully consider the Rule 132 evidence submitted by Appellants during prosecution as it applies to the separate groupings of claims, namely the sulfur organotin and halogen organotin claims on appeal.<sup>17</sup> Despite the Board's characterizations of the data in the declaration, Appellants presented the evidence in a clear and self-explanatory declaration<sup>18</sup> that is (1) commensurate in scope with at least the sulfur organotin claims, (2) compares the most preferred compositions taught by Gough and Stapfer -- those which are deemed by Gough and Stapfer to be the best of the best -- with the claimed invention, and (3) unequivocally demonstrates the superiority of Appellants' claimed stabilizers with the best prior art.

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<sup>17</sup> The evidence was submitted by Appellants to overcome the *prima facie* case of obviousness asserted by the examiner, even though Appellants do not admit that a *prima facie* case exists.

<sup>18</sup> The declarant carefully explains the experiments performed and significance of the data obtained in the introductory pages of the declaration. See, e.g., pages 1-4.

For all of the above reasons, the Board should reverse the examiner's §  
103(a) rejection over the cited references, and allow all pending claims. If any  
fees are due, please charge any such fees to our deposit account no. 06-0916.

Respectfully submitted,

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